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March-April 1982

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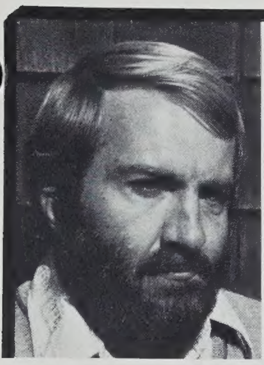

FREE RUN OF THE EDITOR

— DON NEEL —

Thanks to Forrest Tancer for suggesting the topic of corks. I enjoyed the research and found many different point of view on cork quality. I asked eight vendors what choices are available in straight natural corks. There is a progress report on market and laboratory testing of the composition cork at Wente Brothers. I talked to users and the producer of the plastic stopper — Cellukork. I asked four large wineries how they analyze corks before purchase. Many thanks to the vendors and wineries who gave their time and cooperation.

Thanks to Tony and David Storm for a look at the problems of wastewater. Solutions of several wineries will appear in the next issue.

Many thanks to Al Cribari who wrote on MLF and Dr. Ralph Kunkee and all others who proofread the story.

I am impressed by the silicone barrel bung and hope you will give the bung serious consideration.

Many thanks to Bob Kozlowski for his thoughts on the computer and all the time he gave to make sure the story was right.

Paul Obester suggested barrel racks and I hope you find the information helpful.

Thanks to Ralph Montali for insight on marketing and Ray Krause, last issue's marketing columnist, on whom we have heard many compliments.

Thanks go to David Coleman, artist and his ideas which stimulated changes in our journal's appearance.

If we missed a fact or point of view on a topic in this issue, please write! We want letters that will help us cover topics more completely.

Readers, please compliment our advertisers for participating and helping us to bring you a better technical journal.

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PRACTICAL WINERY

March-April 1982
Volume II, No. 6

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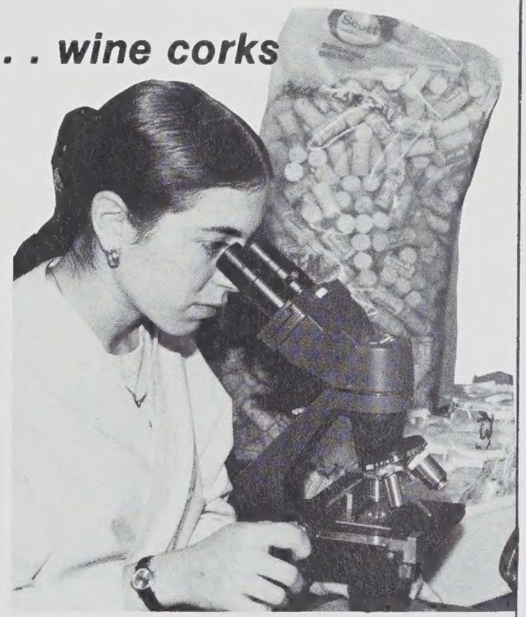
Practical Winery is published bi-monthly by Don Neel and Associates. Editorial and Business offices: 15 Grande Paseo, San Rafael, CA 94903 (415) 479-5819. Subscription Rate: $20/year. Outside the United States, please add $4/year



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CORKS Vendors Offer Many Choices

APM, INC.

APM has made plastic champagne stoppers since 1955 and began domestic production of bulp top and bar top corks in 1975. They added natural #9 corks in 1979, according to William Preston. Grades offered are #1 and #2.

Coatings available are: warm-bloc parafinning, silicon and combination silicon-paraffin block coating. Printing is done by engraving.

A minimum order is one bale (12,500) bagged by the bale or 1000. Sulphur dioxide sterilization is available and delivery time is two weeks. Sizes are 1½", 1¾" and 2".

A statistical quality control program and in-house sorting are carried out during processing at the Benicia plant.

CORK SUPPLY INTERNATIONAL, INC.

Jochen Michalski represents Cork Supply International, Inc. from his office in Hayward which was opened in August, 1981. Another partner in the firm, owns a cork forest in Portugal from which their top quality corks is harvested.

Michalski travels to Portugal every three months to inspect an order there before shipment and to inspect raw material before placing his next order. Michalski will buy from seven producers in Portugal and make a final blend in his Hayward plant. "We are a small firm and able to do more hand grading," he says.

Michalski uses a German printing machine which counts, inspects and rejects off size corks during the printing operation. A minimum order for printing is 25,000 unless the customer pays for the dye.

Cork Supply's recommended coating for the corks is Vinoseal — a mixture of paraffin and vegetable oil which is sprayed on and helps the cork expand quicker for improved elasticity. The corks are bagged in quantities of 1,000 in a vacumn and dosed with a precision measured amount of SO2.

Cold-bloc paraffining is also available but not recommended as paraffin at cold temperatures acts like a glue, which can present a problem in extracting a cork from chilled wine.

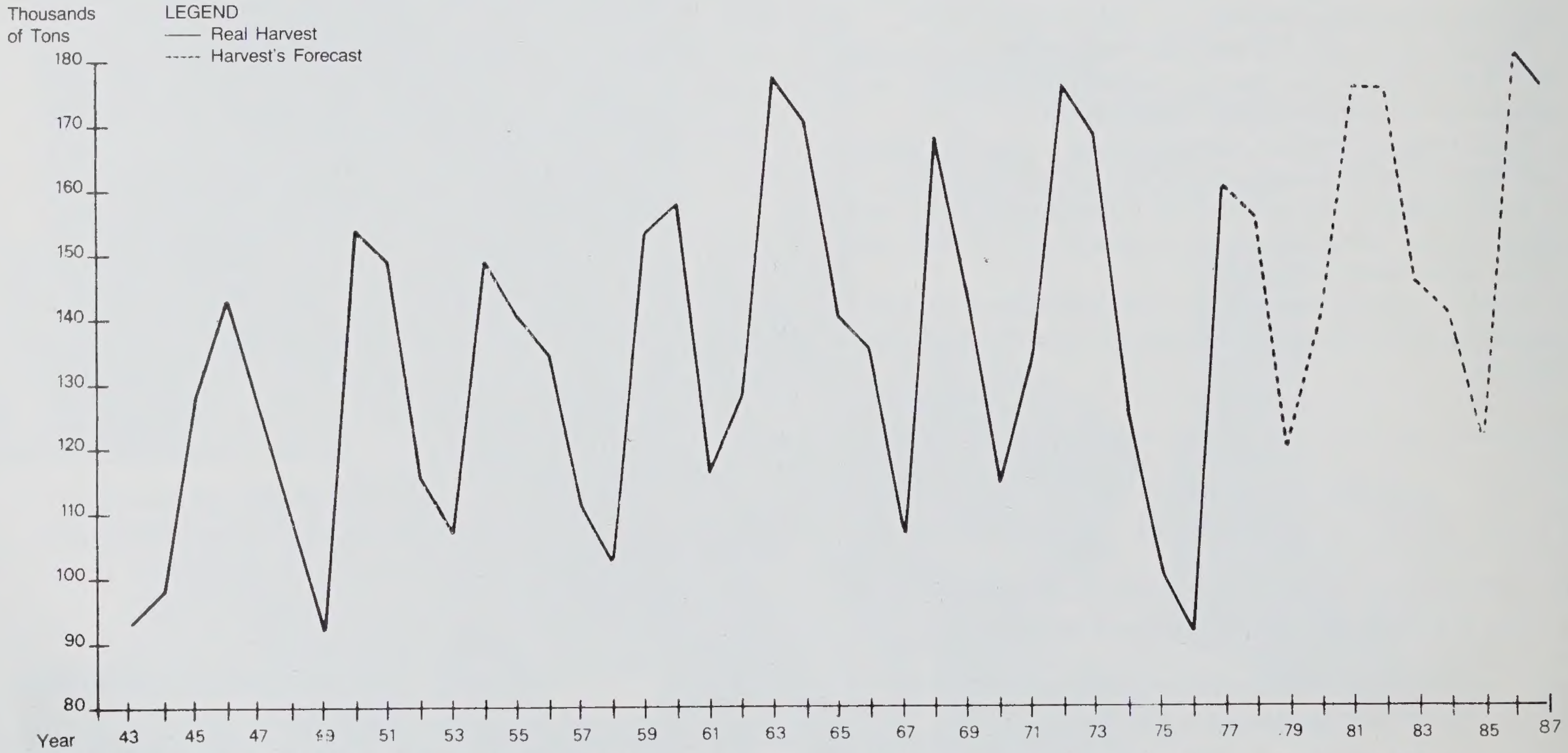
Cork Supply offers the following grades: Super Select, Extra First, and First, Sizes available are 1-¾", 2", and 2-¼". Order time is 60-90 days.

fp PACKAGING, INC.

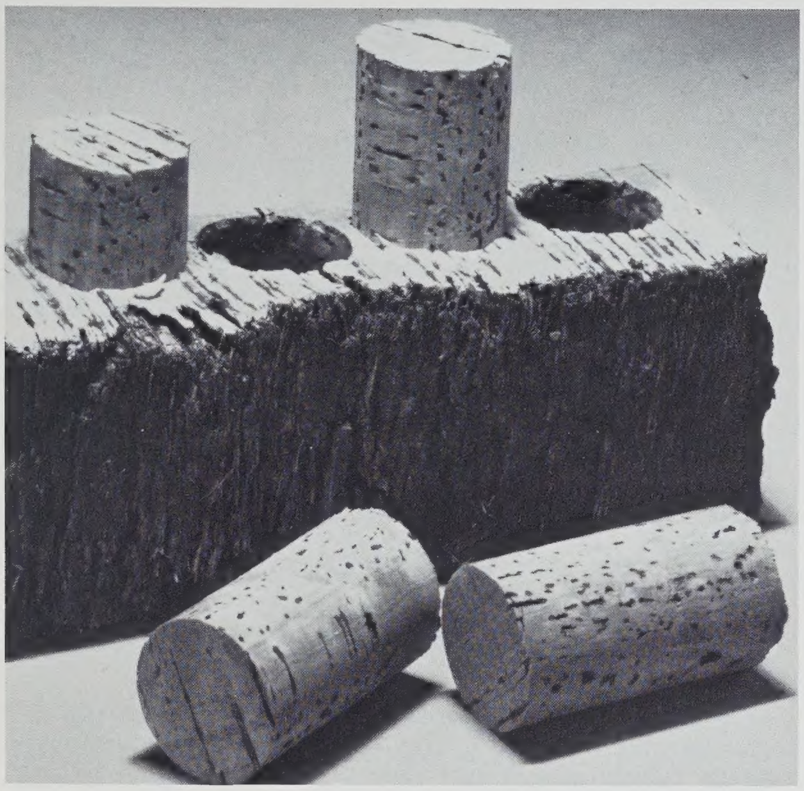
fp Packaging has been supplying corks for the past two decades from their South San Francisco warehouse. They carry an inventory of 30 to 40 million corks.

They offer a choice of chamfered or unchamfered corks, with or without clean ends, in four grade levels: Super Select, Extra First, First, and Special First qualities.

The corks are all vacuum dried and cleaned with the following treatments available: paraffin (cold-bloc or sprayed), silicone , SP treatment, (silicone/paraffin), and fp special treatment (thermo-dried and spurged



CORK PRODUCTION HARVEST VARIATION — — — **The graph illustrates cork production in Portugal (53 percent of the world production) since 1943 until now. It shows the harvest variation through the nine-year cycle. Source — Instituto dos Productios Florestais, Ministerio do Comercio e Turismo, provided by Portocork represented by The Moffett Co.**



CORKS — **Wine stoppers are punched out of cork bark.**

SO2) in heat-sealed plastic bags of 1,000. Hot or standard branding is available.

The minimum order quantity is one bale (1-½" - 15,000 per bale; 1-¾ - 12,500 per bale; 2" - 10,000 per bale). Normal delivery time is approximately two weeks, however they are flexible to give customers the service they require.

We also offer bulb-top stoppers assembled with either normal corkwood or synthetic cork shanks.

LATCHFORD PACKAGE CO.

Gultig treated corks, a patented process applied in West Germany, developed in the 1950's, are available in addition to other treatments processed in San Francisco, according to Curt Goodsill. Top of the line grades are Superior Extra First, Extra First, and First.

At customer request, Gultig corks can be printed with his logo at a minimum or 25,000 corks per order and 90 day lead time. Standard pack is 1,000 corks in sterilized plastic bags. For smaller users, a minimum of 1,000 unprinted corks can be obtained in San Francisco.

Two other cork treatments processed in San Francisco are the cold bloc paraffin and SP2 surface applications. SP2 is a synthetic paraffin, an emulsified liquid applied by tumbling. The established minimum for printed corks is 25,000 with a order time of 2-3 weeks. Cork lengths are 1-1½", 1-¾" and 2". Bale lots are 12,500 or 1,000 at extra charge.

Latchford is the American distributor for ST-11 composition corks made by Columbin in Italy. These corks are in the testing/approval process at a number of wineries. Due to the complex nature of these corks, more information is available from Latchford directly.

THE MOFFETT CO., INC.

According to Jack Squires, Moffett which has been selling corks for 22 years, began direct importation in 1979. They offer the Moffett cork and the sterilized Portocork.

Grades available are: Superior/Selected, Extra First, and First. Moffett can handle custom cork orders for exceptional qualities above the basic grades.

Moffett obtains corks from two primary suppliers in Portugal and buys from others if necessary. Coatings available are: sillicon by spray, sillicon/paraffin by spray, and cold bloc paraffin, all to customers specification of density.

For Portcorks, the minimum quantity for printing or hot branding is 20,000. Corks are bagged in 1000's and sparged with sulphur dioxide if desired by the customer.

Portocork quality control includes a combination of visual and mechanical inspection. The computerized electronic test evaluates air space in a cork; thus, the more pores or hollow spaces in a cork, the lower the grading.

The Portocork process utilizes vacuum drying, which draws moisture from the center of the cork, in contrast to heat drying which can leave an uneven moisture content in the cork.

Standard Moffett corks are available at the San Jose plant in a minimum of 1000. Order time for Portocorks is ten weeks. A file of samples of shipments is kept in Moffett's office. Moffett offers 1½", 1¾", 2", and 2⅛" lengths.

RIEKES CONTAINER COMPANY

Riekes, in addition to their line of glass bottles, has obtained the stopper division of Dodge Cork Co., according to Jack Dice. "We can now deliver all your glass, corks and closures for your bottling together," says Dice.

Riekes obtains their corks from a fully integrated producer who owns the forest and processes the corks. Riekes offers the following grades: Superior, Extra First, First and Second. The producer grades by electronic and hand sorting.

The choice of coatings are: SP2, cold bloc paraffin and silicon which is not recommended. SP2 is a gel developed in Germany, applied by tumbling, which will not flake off when the wine is chilled and helps make extraction easy.

A separate factory in Portugal does the coating and printing or branding for a second level of quality inspection after the original processor. Riekes recommends hot branding to prevent possible smudging from printing, as corks with moisture make ink dry slowly.

Corks are sparged with sulfur dioxide in heat sealed bags of 1,000. Order time is 10 weeks on minimum quantities of 12,000 unprinted or 25,000 printed or branded.

Sizes are 1-¾" and 2". The customer can specify density of coating. Colors of bleach available are white, natural and shades of rosada. Samples are kept of shipments to verify quality.

IF SCHNIER

IF Schnier offers hot branding and printing service from their San Francisco plant. Greater design flexibility is available in printing.

Grades available are: Super Extra Select, Extra Select, Extra First, First and Specials. Coatings are cold bloc paraffin or silicon by spray. The minimum order quantity is one bale — 12,500. Unprinted corks are available with one to two days lead time.

Printed or branded corks can take three to four days for processing. Corks are normally bagged by the bale but can be bagged and sterilized by 1,000's for an extra charge.

SCOTT LABORATORIES, INC.

Bruce Scott reports that Scott Laboratories, which has been sellling corks for four years, changed its grading codes two years ago to maintain consistency.

Scott's stock cork grades are USS, US and UF. They also offer the grades UFB and UFBB, which are special order categories. All corks are placed in individual bags of 1000 which is the minimum order for unprinted corks.

A minimum order for printing is 10,000 and they are handled by a German machine which counts, inspects for off-size and rejects those not properly sized. The printer has the ability to use movable type as well as an engraving. Movable type printing is available at a small extra charge.

Scott processing uses thermal sterilization coupled with sulphur dioxide to achieve wine sterile corks. This method leaves the corks with about one percent lower moisture content and with added resiliency.

Scott conducts a 3 to 5 day laboratory test on samples of every order to check for wine sterility.

Scott coats the corks with paraffin by spray to the customer's desired density. Silicon spray is available at an extra charge and is recommended for a heated jaw corker.

Scott obtains their corks from a large number of producers in Portugal and has enough on hand to handle most orders within 10 days. Stock sizes are: nominal 1½" (38 mm), nominal 1¾" (45 mm) and nominal 2" (49 mm). Other sizes are available on request.

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Maker and Users of Cellukorks

Four wineries, located in Iowa, Ohio and Texas have purchased Cellukorks for bottling from Loral Packaging Inc., of Garwood, N.J.

Metal Box Company, Ltd. of the United Kingdom produced the product after five years of research and development. In April, 1978, Capwell Plastics in Montreal, Quebec, received the following analysis of the product from the Quebec Liquor Control Board: We might state that the phisico-chemical and organolyptic properties of table wines are rated equivalent following comparative tests with natural corks.

Loral Packaging brought the product to the United States in May, 1979, and submitted it to the Bureau of Alcohol, Tobacco and Firearms (BATF) for approval as a wine stopper. BATF could find no health risk and approved the Cellukork in May, 1980.

Heineman Winery of Put-in-Bay, Ohio, placed the first order for 2,000 Cellukorks in 1981. Heineman makes three wines from French hybrid grapes and 80 percent of the wine is sold at the winery.

Heineman has used the Cellukorks in his Swiss-made Frederic semi-automatic corker with no problems. Heineman does not sparge his bottles before filling and uses heat shrink closures on his glass from Owens-Illinois.

"We have been very satisfied. Our wine is ready for consumption when released. You cannot break the Cellukork, therefore you must use a durable cork puller, to prevent damage to the cork puller," says Louie Heineman.

Larry Becker of Okoboji Winery in Arnolds Park, Iowa has bought several thousand Cellukorks. "The uniformity is fantastic," says Becker. Becker uses a hand corker and soaks the Cellukorks in hot water for five minutes before using them. Bottles are rinsed in hot water and sparged with CO2 before filling. Becker has found dry Cellukorks more difficult to work with.

Becker makes several wines sold only at the winery as Iowa is a liquor controlled state. He has bottle-aged the wines on Cellukorks for six months with no problem.

Lyndol Hart of Sanchez Creek Vineyard in Weatherford, Texas has bought 1,500 Cellukorks for his 1980 vintage of Red Table Wine and Cabernet Sauvignon. The wines, bottled in November, 1981, have shown only one leaker and Hart hopes to release the wines in the summer-fall of 1982.

Hart is relying on the Cellukork to perform during further recommended bottle-age by the consumer. He used a hand corker after washing his bottles in hot water and sparging with nitrogen before filling.

Allen Jones of Stillwater Winery in Troy, Ohio purchased Cellukorks for bottling of his red and white varietal wines from French and American hybrid grapes. Jones used the Cellukorks in a Frederic semi-automatic corker in December, 1981.

"Cellukorks offer total uniformity; there is no comparison between them and natural corks," says Jones.

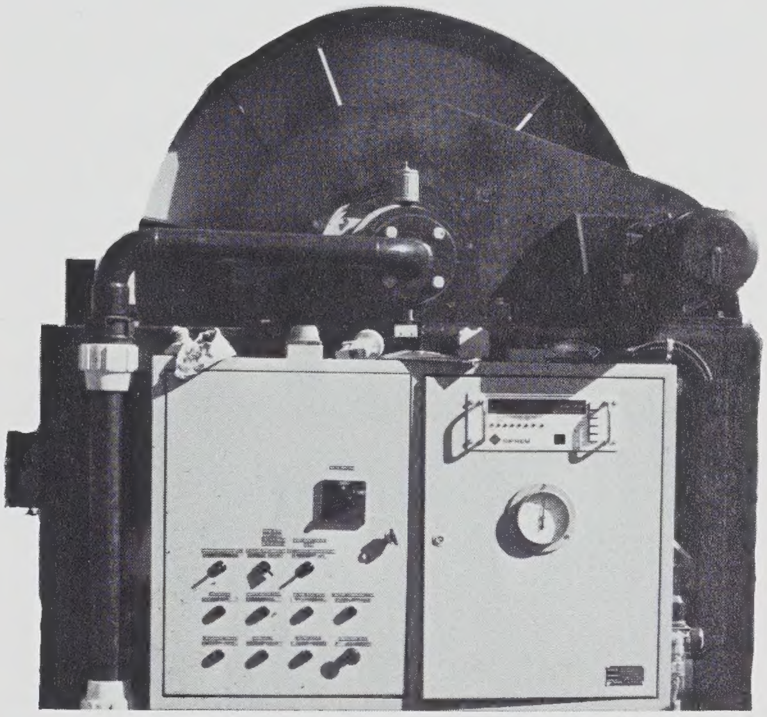
J. Daniel Proctor, president of Loral Packaging, notes that the Cellukork actually decreases the amount of oxygen in wine. Proctor said that a decrease in oxygen is not desired in wines meant to be aged but he feels wineries producing such wines would not want a synthetic cork anyway.

Loral suggests using Cellukorks with light white wines which are fully developed and ready for drinking.

The Cellukork is made of ethylene-vinyl acetate copolymer. Cellukorks are injection molded from polished steel molds and have a .003" layer of silicone applied. The foaming process is patented in the United Kingdom and United States.

Cellukorks are available in two lengths, 1-½" (38 mm) and 1-¾ (44 mm). Shipments are made in sealed plastic bags with 840 1-½" to the bag or 720 1-¾" to the bag, two bags to a box. The price is $64.26 for 1,000 Cellukorks FOB Ontario, Ca., or Garwood, N.J.

Con't. on p. 14



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Winery Wastewater Problems

BY TONY NORSKOG

David R. Storm, is a registered civil engineer in four states and a registered agricultural engineer in California. With a Ph.D. in Water Science and Engineering from the University of California at Davis, Storm founded Storm Engineering in 1968.

Since that time, Storm Engineering has distinguished itself in the field of wastewater and water management. Though they deal with all sorts of water management projects, in the last several years the firm has worked with several wineries of varying sizes. A good understanding of the process is aided by the fact that Storm owns Winters Winery (BW 4983) in Winters, Ca.

In 1973 he organized Spray Waste Inc., which specializes in land disposal of reclaimed wastewater and/or residual sewage solids often with the purpose of agricultural utilization.

David Storm: We've worked with Frank Cadenasso since 1976. He is planning a new site for his winery across the road from the Anheuser-Busch brewery. His wastewater problem is unique because the city of Fairfield wants him to irrigate the landscaping along a bike path with this wastewater. It was kind of interesting because it was the first winery for which we developed some statistics. We found out the literature we normally use, such as Journal of the Water Pollution Control Federation and Water Pollution Abstracts didn't contain any winery related information.

Tony Norskog: This is a problem I've run into. The published figures, such as those in ASE (American Society of Enology) Journal were for wineries with stills which are not at all applicable to wineries making table wine. What figures do you use to estimate a wineries' process water effluent?

DS: A good round number we used in 1976, a figure supported by Cadenasso who is not a water conservationist by his own admission, was about 1000 gallons per ton of grapes crushed. This figure applies during crush and other processing. If a winery crushes and processes all of its own grapes, the number might be a little higher. In larger wineries it does not really take a lot more water to wash a bigger tank than a little one, so there is probably an economy of scale there. Another figure we have used in some estimates is ten to twenty gallons per case produced, again the lesser figure is for the larger winery.

TN: Would a larger winery with less supervision have more incidence of water waste, the hose in the gutter-type problem.

DS: What happened, is a lot of these wineries went through the 1976-77 drought when they had to deal with a water shortage and still make wine. Many wineries buy their water from a public purveyor or water utility and when the winery manager saw the savings in dollars, he said, 'Why can't we do this again?' The conservation effort has stayed with many industries since the drought and the effort is helping them to use less water.

Some of the wineries use "Sterling nozzles", the high pressure-low volume nozzles, which save a lot of water. Another idea I have seen, is the use of timers on pumps. If you want to add only 150 gallons of tank cleaner, that is all the timer will release. The same arrangement can be used in the rinse cycle. This gives them better control, so that what comes out of the plant, matches the design of the system.

TN: What percentage of the hydraulic loading is delivered during the three months of crush?

DS: We don't have any exact figures for this but I would guess about 60 percent during the crush and 40 percent during the remainder of the process steps.

We have worked with the petroleum, food processing and municipal waste industries. The problem with wineries is that the process changes seasonally. So the volume of waste water changes, the strength of the waste stream changes as well as the constituents. From our position as process design engineers, designing a system that responds to a variable input is difficult because the biological system has to work.

We don't use chemical treatment as much as we use biological systems to reduce organic waste in the stream and when you have a variable, the organisms do not like that. The organisms like steady-state conditions.

That is the problem — to have a system with enough buffering power to deal with shock loads and to deal with the maximum waste strength you are going to produce, such as during the crush. You might have a system divided into modules and have some modules come off-line when they are not needed. For example, have your pond divided into cells that can be added or taken off the line to match the hydraulic and solids loading more precisely. You could have one huge pond to accommodate the crush and a smaller one for the balance of the year.

The big problem with winery wastewater is a high loading of soluble BOD (Biochemical Oxygen Demand), carbohydrate and sugar. In municipal waste, we have a large component of waste that is settleable solids. High removals are possible with gravity sedimentation and the partially treated effluent can go onto a secondary biological treatment system for final removal of BOD. On the other hand, soluble BOD needs to be handled by a different process.

WASTE WATER CONSULTANT — — — David Storm wears three hats: Storm Engineering, Spray-Waste, Inc., and Winters Winery.

TN: What about some of the cleaning solutions used in wineries, such as chlorine compounds and others, do they present a problem in waste treatment?

DS: Sure, chloride ions could cause problems but these washing agents are generally diluted. In practice, you are washing down with clean water and the dilution generally prevents a problem as far as toxicity to the beneficial microbial flora which break down the waste material.

A spill would be a disaster. If you put two or three thousand gallons of wine down the drain, then the treatment system might be upset for two or three weeks.

TN: Is this due to the drop in pH?

DS: Yes, it is important to keep the pH at the right level that is desirable for the micro-organisms necessary for the treatment process. You need a Ph adjustment, because just the waste stream itself is going to vary considerably. You need to adjust pH by the addition of sodium hydroxide, potassium hydroxide or maybe anhydrous ammonia for a nitrogen source, because winery wastes are short on nitrogen.

TN: Can we look at a 50,000 case winery which did not have the option to give wastewater to the city. Say, they had to treat and dispose of all the wastewater themselves, can you put this out on your vineyard?

DS: That is certainly one option, and a good one at that. Realize that, even if you were a "zero discharge" person, and you had a vineyard closeby where the costs of pumping weren't too high, the state would still be involved. You must approach the state and say, "these are our plans." The state would probably require some kind of pre-treatment. Not that there would be any health hazard, but just to prevent nuisance odors and so forth.

Another thing is that you are not going to want to irrigate a vine all year round. Irrigation is a seasonal thing and supplemental irrigation of vines is generally required to achieve reasonable yields. Recycling is fine but it can't generally dispose of all wastewater production without some way of storing the reclaimed water.

It is likely that the peak period of water use — during crush, is when the vines do not really need irrigation. Storage is the next thing. Where can you put in an equalizing storage pond which will take some space? Then again, treatment is essential, so the water can remain in storage and not produce nuisance odors.

You might offer the water to someone else who would use the water at that time of year, maybe a Christmas tree farmer or livestock operator with pasture lands.

TN: Would there by any problem with heavy metals concentration or noxious minerals?

DS: There should not be any heavy metals. There is boron in some of the cleaning agents and boron is a tough one to remove. Even boron should not be a problem, as the quantities are relatively small.

Bentonite can be a problem as it coagulates and produces a floc in the wine, which is what you want, as it then removes the protein by sedimentation. When that becomes part of the waste stream, it becomes resuspended and can be difficult to get out, as it is collodial in size.

Bentonite does not settle well in a pond due to natural agitation. Wind agitation is adequate to keep it suspended for long periods of time. Bentonite is an inorganic solid material, so it doesn't cause any odor problems. If you treat wastewater and put it in a leachfield, bentonite has caused some real disasters for wineries with conventional septic tanks and leachfield systems. It is advisable, depending on the system, to separate bentonite finings from the waste stream and dispose of them elsewhere.

TN: A 50,000 case winery might run down the drain between five and ten thousand gallons of gross lees. This is 10 to 12 percent alcohol and quite high in protein due to all the yeast. Is there a way to reclaim that?

DS: Yes, there is a farmer in Winters with a "rental still". This is a trend in handling of gross lees that I see coming, and it makes a lot of sense. But once you extract the alcohol, you still have the residual solids. What you can do is run it out on a sand bed and allow the supernatant to trickle through the bed, leaving the solids behind. This doesn not take much land and you could cover it with fiberglass if you have to do it during the rainfall time of the year.

TN: Would a winery that is in a zero disposal mode, need extensive systems to handle its waste?

DS: Well, there is a whole laundry list of things you could do with the water. You can use coarse filtration screening. The rotary drum screens, that wash themselves, are very useful, particularly if you have a centrifuge. The rough screen would remove a large quantity of the larger solids so that you do not have to deal with them later in the process.

TN: Are they cost effective?

DS: That depends on how much you are against the wall. This is where it would be advisable to hire a design engineer to show you the most cost-effective system. After screening, the effluent would have to be neutralized, some nutrients added, then put into an areobic system which is most desirable for reduction of odors.

TN: What is the best land use?

DS: Probably aerated lagoons. They are costly to operate because they are power consumptive. A timer is applicable here due to the strength and volume of the water being variable. You can have the oxygen transfer rate controlled by putting the aerators on a time clock.

This can be like owning an aquarium. You go out and look at it, and if your dissolved oxygen readings are low, you turn on the aerator. If it is too low, in pH, you throw in a little lime. This is a continuous management problem.

The oxidized effluent could then probably go to a clarifying cell or settling tank, and after that, the water can go to its disposal — city treatment, reclaimed water use, or whatever. The solids in the settling cell will accumulate over time, so it is best to have two cells, so one can be dewatered and cleaned while the other is in use.

A more refined clarifier would have sludge return, where you take activated sludge, which has a high concentration of aerobic organisms, and pump it back to the head-works of the system, so the feed stream requires less neutralization. In this way, when the raw waste and the activated sludge is mixed, it does not take as long for the organisms to multiply and begin working.

You could use a more sophisticated system where you store the sludge in a tank and have a tanker truck come around and pump out your sludge and dispose of it in a sanitary landfill.

TN: What happens when a winery is handling process wastes and sanitary wastes (restaurants, restrooms, etc.)?

DS: It is generally best to separate them if the plumbing has been properly planned. Down the road, you may want to recombine them, perhaps at the outfall, but each does present different problems of treatment.

Wastewater systems are not something you can walk away from. Like the aquarium analogy, you have to watch them and because of the highly variable nature of winery waste, nothing works well all of the time. You need someone knowledgeable monitoring the system and to keep it tuned up.

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MLF Simplified For Non-Technical

BY ALBERT B. CRIBARI

Malolactic fermentation (MLF). Nothing seems to puzzle the serious oenophile, or indeed, many professional winemakers, more than this term. And indeed, why not? Most non-technical people do not know of the many acids and sugars that are in wine. The acids in the grape are of extreme importance. Without them, not only would we not have a wine as we know it, but wine would be impossible to age.

So here is a very quick and overly simple explanation. Malolactic fermentation merely means the change from malic acid (a very tart acid) to lactic acid (which is somewhat less tart) by means of natural fermentation by naturally-occurring (usually) lactic acid bacteria (Lactobacillus or related bacteria). The result is that the wine tastes less sour or *acidy*. For wines high in acid, such as occur in northern California and northern Europe, this results in an improvement in quality. Conversely, for wines of proper acid balance (such as the Fresno area wines) the malolactic fermentation can be without value or even harmful in terms of taste.

But to pursue the subject further, in my younger days I did not bother much about malolactic fermentation. We at Cribari made our own wines in Fresno from San Joaquin Valley grapes and we were not bothered with or much interested in malolactic activities, except to prevent them. Uncontrolled fermentations could lead to spoilages. Later on as we began to utilize Mendocino County grapes, we had to investigate ways to reduce the use of sulfur dioxide (SO_2) to market wines of lower sugar and lower alcohol. The subject then became of great interest.

So here are some details: Malic acid which is the principal acid of apples (and thus its name) is present in grapes to the extent of about 40 percent of the total acidity, depending upon geographical region. If the season is cool then the acid naturally present may be more than is wanted. The wine may thus taste too tart or sour. If the proper bacteria are present then these micro-organisms can ferment the malic acid to lactic acid plus carbon dioxide. Since lactic acid (the principal acid present in sour milk, sauerkraut, etc.) is only half as tart or sour as malic acid, the wine will taste less acid.

However, suitable conditions for the growth of lactic acid bacteria must also be present. Too much sulfur dioxide, extremes of temperature and lack of trace nutrition elements all play a role in whether or not the wine will spontaneously undergo malolactic fermentation. Some wineries seem to have a regular malolactic fermentation in all or nearly all of their red wines. Other wineries have great difficulty in promoting the fermentation, even with pure malolactic bacterial cultures. And still others get a malolactic fermentation when they least want or expect it!

If the strain or type of bacteria is not the proper sort, the malolactic fermentation can produce an off odor ('Mousiness' to some tasters, or pickle-like flavor) that is most unpleasant to me. Also, if the malolactic fermentation occurs in the bottle, it will almost surely cause a gasiness (not too serious unless it pushes the cork out!), and a haziness, plus eventually some sediment from the micro-organisms, of course. Also, it has been found that malolactic fermentation can produce a rather powerful and strange geranium-like aroma if it occurs in the bottle.

It is our policy therefore, to promote the malolactic fermentation in those wines that can benefit by it while aging in the cellar. This has usually been accomplished through trial and error but we are continuously learning more about this phenomenon. Proper malolactic fermentation can add complexity to a red wine especially, it seems, if the bacteria is carefully selected. In many wineries, malolactic fermentation is achieved by deliberately inoculating with a bacterial culture. (ML34 is one).

Next we avoid the fermentation in the bottle by very

Con't. on p. 22

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Many Wineries Use Silicone Bung

At least two California wineries have replaced all of their barrel bungs with the Boswell silicone bung introduced in 1981. The bung is made of high grade silicone rubber.

Normal use of a bung should not wear out the material or cause deterioration. Food industries and laboratories use silicone rubber stoppers because they are known for neutrality, longevity, strength and fungus resistance.

The bungs are available from the Boswell Company in San Rafael, CA. The cost is $4.95 each or $4.70 each in a quantity of 100 or more. The size is 2.102" long, 2.215" large diameter and 1.84" small diameter.

Jim Boswell, modified the bung after introduction to the idea by his brother-in-law, who was using them in a French winery. Boswell is currently the US sales representative for Tonnelleries Sirugue barrels from France.

Ric Forman at Forman Winery has a very humid underground cellar and needed a bung which repells water, stays dry and would not be a place for mold or vinegar bacteria to form. Forman purchased 400 silicone bungs, one for every barrel in his winery.

"They seal well. We roll our barrels of Cabernet and there is no leakage," says Forman. "I ferment Chardonnay and Sauvignon Blanc in the French barrels and leave the hole open during active fermentation and set the bung in the hold loosely which will vent while fermentation is finishing. I have not found fermentation locks to be necessary," he added.

Cooperage life should be prolonged as the bung is placed by hand; no hammer is necessary. Thereby, the bung hole should not be enlarged by continuous placing, or should not cause a cracked bung hole stave.

Merry Edwards of Matanzas Creek Winery obtained a couple of silicone bungs in France and tried them for a year. Satisfied, she bought 160 from Boswell, one for every barrel in her winery.

"The bungs reduce our topping time. You don't have to tap carefully with a mallet, making sure not to hit the stave," says Edwards. "You don't have to coat the bung. Coating is always a problem because it's difficult to get an even but thorough application."

Matanzas Creek was using redwood bungs which lasted about three years. Edwards' French barrels hold

"I want to worry about growing grapes and making wine. I don't want to worry about leaking barrels."

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Chardonnay, Muscat, Cabernet, Pinot Noir and Merlot. "The bung comes out easily, when you want to take a sample," says Edwards.

The bungs are interchangeable and should not need notching to match a bung to a particular barrel, which is a help to Francis Mahoney at Carneros Creek Winery.

"The beauty of the bung is no wicking. They are clean and there is no mold buildup," says Mahoney. Mahoney obtained a few in France in 1980 and has used them with Chardonnay.

He bought 35 from Boswell which are in his American oak barrels holding Zinfandel. Wood bungs last about two and a half years at Carneros Creek.

"It is such a good seal, it won't budge!" says Mahoney. "Make sure the wine has completed malolactic fermentation and there is no residual sugar left in the wine before you place the bung all the way in," he advises.

The clean-up job created by wicking with wood bungs at Carneros Creek has been eliminated.

Steve MacRostie at Hacienda purchased 50 silicone bungs from Boswell and they are used on barrels of Chardonnay. "We are satisfied with their sealing ability," says MacRostie.

Redwood bungs have worn out at Hacienda in three to four years. "There is no prior treatment to the bung necessary, as with a wood bung. They are sanitary, convenient, and extremely durable," notes MacRostie.

Alexander Valley Winery purchased 100 silicone bungs which are in American oak barrels made by A & K Cooperage. The barrels are holding Chenin Blanc or Chardonnay and have been rolled 30 degrees with no leakage.

"We have used fir, oak and redwood bungs, they all tend to swell and damage the stave but not the silicone," says Hank Wetzel, winemaker at Alexander Valley.

"When the wood bungs soak up wine, they will attract fruit flies. A nuisance prevented by the silicone bung," adds Wetzel.

Calera Wine Company has purchased 50 silicone bungs from Boswell and they are in use on French barrels holding Pinor Noir.

Josh Jensen of Calera reports, "I like them very much. They make a perfect seal. You can hear the vacuum sound indicating positive pressure when you take a bung out."

Winery workers at Calera enjoy not having to use a hammer on the bungs. The bungs are placed lightly on the barrel until the wine has completed malolactic fermentation and then sealed.

Calera may purchase more of the silicone bungs to replace their redwood bungs which have two coats of epoxy as they wear out in four to ten years.

SILICONE BARREL BUNGS — — — More than ten California wineries are using the bungs available from the Boswell Company in San Rafael, CA. A silicone bung of slightly different design is in use in several French wineries.

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CORKS

Con't. from p. 7

Cork Analysis Before Purchase

ALMADEN VINEYARDS

Almaden Vineyard, in San Jose, Ca., has a quality control program which has been looking at corks closely for eight years, according to Chuck Shea, head of quality control at Almaden.

When vendors submit samples, the corks are measured for length and diameter, checked with a moisture meter for moisture content between 7 and 9-½ percent, and visually inspected for a light coating of paraffin and clean ends. The cork samples are cut in half lengthwise and inspected for mold, if any one cork has mold, the sample lot is rejected.

Almaden is concerned about clean ends, as they believe that will prevent the possibility of particles breaking off of the cork in the corker feeding mechanism and maybe ending up in the wine.

If there is a question of mold or discoloration on a shipment, Almaden will cut the corks and submit them to a 24 hour soaking in white wine and then conduct a taste test with the wine.

"We have a production goal of leaving the bottles upright for 24 hours to vent the head pressure and then turning over the pallet of cased bottles for storage and bottle-age," says Shea.

PAUL MASSON VINEYARDS

Paul Masson Vineyards has a quality control program which includes a materials laboratory that looks at corks and conducts tests on bottle labels and other winery material purchases.

A pressure test is used at the Saratoga, Ca. winery and also by the purchasing agent of Seagrams in Portugal. Seagrams owns Masson, Gold Seal in New York and 11 other wineries in the world.

In Portugal, the purchasing agent takes samples from bags of corks on the producers' floor and tests them before purchase. The test results are available in 24 hours and show any visual distortion which occurred. During the four years Masson and Seagrams have conducted the test, they have developed their own standards of acceptance.

With these standards, in addition to inspection for size and moisture, the purchasing agent will decide what corks to buy. Masson's corks are shipped to California where processing and laboratory checks continue.

The pressure test evaluates the density of the cork. The goal is an even density throughout which will not result in uneven distortion and possible leaking or seeping. Masson bottle-ages red wine six months in their warehouse. Samples are taken after this time to identify cases of "wine travel" or wine seeping up the neck. These observations are related to the batch or corks used and their distortion record after the pressure test.

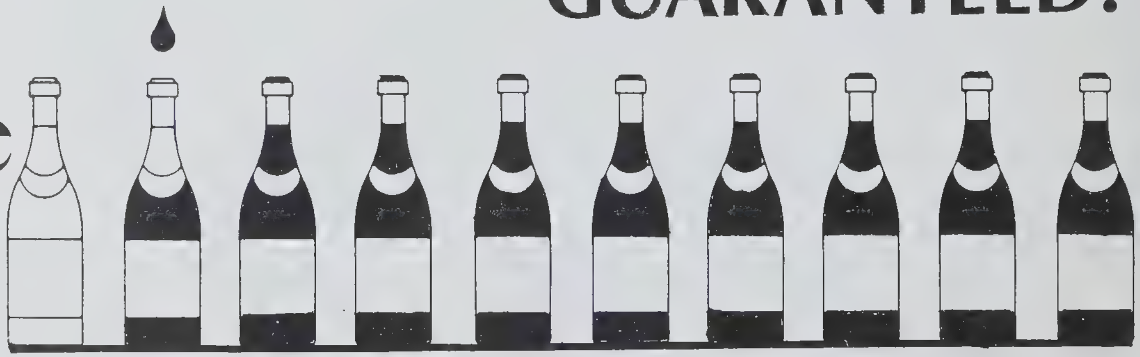
Larry Brink, director of quality control at Masson, says that this interest in corks increased after Masson experienced a large lot of leakers in 1975. "Our inspection program has reduced the possibility of leakers," he says.

"We have been looking at the Cellukork in our laboratory. We have done test bottle runs three years with the Columbin ST-11 composition cork as a possible stopper if a cork supply shortage occurs in the future," adds Brink.

Masson is using cold-bloc paraffin but has looked at other surface treatments. Brink traveled to Europe recently to look into other treatments, in a continual search for an easier and faster application. The Masson laboratory has a chemical test to check the paraffin level in their processing.

Masson uses 20 million straight corks per year and keeps a one year supply on hand. This allows them more freedom to purchase selectively and to save money as the price of corks goes up. Masson and Seagrams began purchasing directly from Portugal in 1976.

Masson has their corks chamfered in Portugal as they believe this reduces the chance of a cork particle ending up in the wine.



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ROBERT MONDAVI WINERY

Robert Mondavi wineries at Oakville and Woodbridge, California have quality control programs which inspect corks. Under the direction of Jim Vahl, the goal is to reduce cork contaimination and leakage.

Every sample lot of corks submitted by a supplier is subjected to several tests. Length and diameter are checked and a moisture meter is used to check the humidity in the cork. Mondavi has found a range of 5½ to 9 percent humidity to be acceptable.

A visual inspection of ends and sides is done. Cuts or pits 1 mm deep on ends are a standard for rejection. Cracks or channels within 3 mm of the end are a standard for rejection.

There is a test to check bleach content. A taste test is conducted to check for off-odors. The soaking that occurs for the taste test will also indicate porosity of the cork. The taste test has eliminated corks with rosada bleach as they have affected the wine either visually or in the taste.

TAYLOR CALIFORNIA CELLARS

Taylor California Cellars in Gonzales, Ca. began looking closely at the corks they were purchasing two and a half years ago, according to Ed Filice of the production department.

Taylor will ask a vendor to provide a sample lot of 1,000 corks for inspection. They will then pull a random sample of 125 corks for testing.

Taylor measures the diameter and length of the samples and checks for corks that are out-of-round. A moisture meter is used to see that the moisture is between six and ten percent. A visual check is done to verify a light paraffin coating.

A visual inspection looks for vertical cracks on the shank. If the crack is over 50-75 percent of the shank's length, the cork is rejected as a potential leaker or poor performer in the corking machine. Worm holes and excessive voids are physical imperfections Taylor looks for and will reject. Taylor also looks for bark or belly, the inner or outer surface of the cork block which might appear on the side of the cork and be cause for a leaker.

Taylor does specify clean ends on their corks as they believe that there will be less chance of dust falling from the cork into the wine during the compression and insertion process.

Taylor's acceptance standard on a sample lot is 10 or less rejects.

Composition Testing at Wente

Wente Brothers in Livermore, Ca. have done extensive tests on the combination or agglomerated cork for several years. They have tested over a dozen different manufactured products from Portugal, Spain and Italy.

Wente began looking at composition corks after experiencing a significant amount of leakers during two years of using super select natural corks. Their primary goal is to find a better, more consistent stopper which may not save them any money over the natural cork.

Many samples failed pulling or leaking tests because of the binders (glues) used, method of manufacture, size of the cork particle or the surface treatment used.

Columbin of Italy makes the ST-11 by the injection molding process with a proprietary paraffin surface treatment which is used in Italy in lower-priced quickly consumed wines. This product has come closest to passing Wente's tests.

Wente bottled some 1977 Petite Sirah and test marketed the bottling with the ST-11. Most response was favorable, according to Eric Wente, but the Ah-so cork puller created some problems. The cork has less elasticity than a natural cork and if the prongs of the Ah-so are not seated properly, the sides of the prongs might twist and score the bottle. Thus breaking the bottle neck.

Tests are continuing with Columbin trying to improve the elasticity to better accomodate the Ah-so. Tests at Wente have shown the Columbin to have fewer leakers than an equal sample of natural corks.

Composition corks made by the extrusion process do not offer acceptable elasticity to seal the bottle, according to Wente tests.

Willie Joslyn, winemaker at Wente, says the composition cork offers more even density or strength because the cork has been chopped up and glued back together with more uniform particle distribution. Joslyn notes that in a natural cork where there are uneven growth rings, the dense growth will fold into the soft growth and leave a crease in the cork which will be the point of leakage.

Binders used in the Columbin are food grade and the ST-11 has passed all taste tests.

Another reason for the research, according to Wente, is that the natural cork supply is slowly dwindling as wine production increases and no reforestation is being done. Therefore an alternative stopper must be found. The alternative might be insurance against the political instability of Portugal and other cork producing countries.

Joslyn notes that Wente wines as well as others may be asking more of the stopper today because of increased pressures in the headspace due to winemaking techniques. "This may be a coming trend, and it will be harder to keep the wine in the bottle," says Joslyn.

"We started making some wines that are handled very little from crush to bottling. Some varieties were fermented at 45-55 degrees, racked only two or three times and filtered once before bottling. That left a lot of dissolved CO2 in the wine, which created a lot of pressure in the bottle. We bottled some of these varieties with seven inches of vacuum and a half-hour later, there was five or more pounds of pressure pushing that wine right around the cork," says Joslyn.

Wente hopes to do another test bottling in the marketplace with the ST-11 with the 1981 or 1982 vintage and find an acceptable agglomerate by the end of 1982.

EDUCATION

(This column is one in a series focusing on enology and/or viticulture programs currently being offered at various colleges and universities throughout the United States.)

In this issue we visit Oregon State University (OSU) at Corvallis which offers an interdisciplinary program in enology and viticulture that includes graduate research, extension work, technical assistance and training of industry personnel.

One of the University's primary objectives is a cooperative project between the enology and viticulture groups to optimize wine grape production and wine quality in Oregon, according to Barney T. Watson, OSU research enologist.

This involves evaluation of numerous varietals of V. vinifera from experimental plots in the wine grape areas of the state, selection of new clonal material of promising varietals, research on production problems in Oregon vineyards and research on wine production, stabilization and new processing techniques.

Currently the University's Department of Food Science and Technology is working on the following enology projects.

1. **Protein Instability:** Studies include those on the nature, detection and removal of protein instability in white table wines. The application of bentonite substitutes is being investigated including the use of protease enzymes.
2. **Ultrafiltration:** The application of low pressure membrane ultrafiltration technology to clarify and stabilize grape juice and wine.
3. **Isolation, characterization and use of Oregon Malolactic bacteria** (in cooperation with the Department of Microbiology): Several Leuconostoc oenos bacteria are being isolated and characterized from Oregon wines in order to select organisms better suited to conditions of low pH and low temperatures.
4. **Determination of Malate, Tartrate, Na, Ca and K in Oregon musts and wines:** For use in problems concerning pH, malolactic fermentations, grape maturity, and Ca and K tartrate instability.
5. **Determination of Mesurol residues in juice and wines:** Mesurol residues were determined in finished wines which could not be removed by filtration or fining. No undesirable affects on fermentation were observed and no conclusive evidence of negative effects on wine quality were obtained.

Viticulture projects being researched by the Department of Horticulture include:

1. **To determine the maximum yields of several cultivars:** Including Pinot Noir, Chardonnay, White Riesling and Cabernet Sauvignon. Pruning levels will be adjusted with maximum vine exposure and optimum levels of K, B and N in three regions of western Oregon including the Roge and Illinois River Valleys, Umpqua River Valley and the Willamette River Valley.
2. **To manipulate vine training, nutrition, soil moistures, clones and rootstocks:** To improve yields and advance berry maturity of several cultivars.
3. **To determine exposure, solid and environmental factors which regulate V. vinifera cropping and wine quality.**
4. **To evaluate clones and/or cultivars from various sources in Germany, France and California.**

Because of the rapid expansion of the wine industry in Oregon (from 1975 to 1981 the number of wineries has increased from 12 to 37) considerable effort has been made to provide the industry with technical assistance and training, Watson said.

The University's Department of Horticulture has provided assistance to the industry on site selection, soil analysis, trellising, production methods, spraying, nutrition and pathology.

In the Food Science Department technical assistance has provided for training in analysis of musts and wines, quality control management, cellar practices and production problems.

The department has also assisted in the areas of microbial instability, protein instability, acid reduction methods, malolactic fermentations, Ca and K tartrate instability and in other clarifications and stabilization problems.

A great emphasis has been placed on training industry personal to deal with these problems, Watson said.

Several industry workshops have been presented covering table wine clarification and stabilization, quality control management, basic analysis of musts and wines and sensory analysis of wines.

Further information concerning the University's enology and viticulture programs is available by writing the Department of Food Science and Technology or Department of Horticulture, Oregon State University, Corvallis, Ore., 97331.

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WINE MARKETING

BY RALPH MONTALI

There are more than 400 wineries in this state. They come in all sizes. On one end is the small former amateur home winemaker, now turned professional, whose goal is recognition for his wines, glory and wishfully some profit so as to justify his personal love affair with this intriguing activity.

His dynasty might include ten acres of vineyard, two stainless steel tanks, 20 oak barrels, a limited investment in exotic winemaking equipment and a burning desire to produce the ultimate wine.

At the other end of the spectrum is the awesome and might GALLO, whose domain covers acres and acres of stainless steel and oak barrels (above and below ground), plus all else needed to support a multimillion-case habit.

Despite the difference in size or objectives, each must seriously address the subject of marketing and sales in the best manner for their needs. Both, along with other wine operations in between, would be fools not to acknowledge the importance of the "end line" - PROFIT.

For those of you who don't know what the word means — let me give it to you straight. It is what is left for you to enjoy or spend when you are fortunate or smart enough to take in more than you put out.

Profit comes from sales and sales are best generated from a marketing plan of some sort, tailored to fit the specific needs and goals of the winery.

For some unexplainable reason, this simple process is either ignored, misunderstood or is foreign to all but five or six percent of California wineries. Incredible.

This fact is obvious when one reads the corporate and management profile of each winery. It is not at all unusual to discover that in many cases the owner himself is the winemaker, bottler, purchasing agent, and marketing director, etc.

As his winery grows and prospers, the multi-role he once played is now decentralized to include either his wife, daughter or son as the winery's marketing and sales director. The next step up the ladder of achievement mandates a qualified, effective marketing manager or an independent company (broker) to handle the function of expanding sales. The critical period in a winery's growth pattern is when the annual volume approaches 25,000 cases.

For the purpose of being helpful and to contribute some useful information and guidelines, I would suggest that you review with me some of the fundamental tenets of a successful wine marketing program. Let us start with an assumption and some definitions.

My first assumption is that **MARKETING IS A SCIENCE.**

MARKETING is the total of all activities by which transfer of title or possession from seller to buyer is effected. To be an effective marketer, some research is involved.

RESEARCH is the gathering and studying of data relating to consumer preferences, their purchase power and the general demographics of their particular markets.

These facts (or truths) are then systematically arranged by a method in which the problem is identified, additional data are gathered, a hypothesis is formulated and the hypothesis is *empirically* tested.

EMPIRICAL is the knowledge gathered from or guided by *experience*, or experiment, provable by *experience* or experiment.

EXPERIENCE is the process or fact of personally observing, encountering or undergoing something; practical wisdom gained from what one has observed.

CONCLUSION: A qualified wine marketing director is an experienced person, wise and skillful in his field; a practical veteran; a specialist.

I modestly consider myself to be one. However, there are times, such as when a Tom Jordan comes along and strikes the exact right combination of being in the right place at the right time with the right tools to produce the right wine, a Gold Medal (his 1976 Cabernet Sauvignon), that I wonder if the success of this phenomenon doesn't change the wine marketing plans of many wineries.

In Jordan's case, as with other small premium wine producers, the marketing objectives (sales) are achieved through the magic spell of wine writers and other opinion makers, who, like the legendary Pied Piper of Hamlin Town, wield an influence over a large following strong enough to catapult an obscure winery, or a particular vintage, into the limelight, creating almost overnight a demand exceeding the winery's inventory and at the same time enhancing its overall image to open the door for other lesser wines which the winery must sell.

While the process is neither scientific nor empirical, it is for them very gratifying and fulfilling — at least for the moment. The danger lies in the belief that this is effective marketing — it isn't!

In some future article, I will write about a carefully conceived, successful marketing plan which built an unknown, unheralded, unpublicized, cork-finished line of good quality California wines from zero to 50,000 cases annual sales in less than two years; a plan which I couldn't sell or even give away — so I worked it myself!

Arrivederci.

Ralph Montali is a wine sales and marketing specialist. His career in the industry spans four decades and includes ownership of retail, wholesale and production companies. Correspondence to Montali can be addressed to Practical Winery's San Francisco office, 2521 Sacramento St., 94115.

Computer Assists Kenwood Winery

This interview is the first in a series which will explore the use of a computer to establish a winery management system. Future interviews will feature other computer firms and their client wineries.

Participants in the interview are Bob Kozlowski, winemaking consultant, at Kenwood, who began working with Datamasters Computer Services in Sacramento in 1979, and Richard Hoover of Datamasters who handles marketing-customer service and works with Gary Slavit, programmer.

PW: How did Bob Kozlowski become a winemaker?

BK: I started making wine at home in 1962. There were a few years of frustration in that I could not learn fast enough because I was only making one or two wines each year with a friend. Some friends at Christian Brothers interested me in some other grapes to work with and I then made small quantities of as many as 15 different wines each year. I was able to study affects of yeasts, barrel types, and blending, etc. and therefore I learned faster what it takes to be a winemaker. Also, I took courses at Davis and talked to a lot of winemaker friends to supplement my chemistry experience.

PW: Bob, how did your background in chemistry and computers at Standard Oil prepare you for the use of a computer in winemaking?

BK: Through my past work at Chevron Research as a chemist and in my present position at Standard Oil in litigation, it became very apparent that the computer can be a very useful tool to both the scientist and the people doing litigation work in handling large amounts of data.

The computer works with the data in the same ways that one would normally do by hand, but it gives you the opportunity to do even more things, some of which you might not have even thought of doing, because the data is in a form that is easily retrievable.

The problem is to get the user and the computer people to talk the same language so they can get the work done. I find it easy to talk to computer people because of my background as a computer user.

One of the questions I ask is, 'What would you do with the data?' A user responds with the process and finished form. I say — great! Now put the data in the computer which will handle the data faster because it will do exactly what you tell it to do. Basically, a computer takes a large quantity of numbers and manipulates them in a way that might be difficult or too costly any other way.

PW: What created the need for a computer at Kenwood?

BK: In the mid-70s, I was putting in too many hours at Kenwood in addition to my job at Standard Oil. I could not find the time to do other things besides work. I wondered what was taking so much time.

Coming home on a plane from a business trip, I wrote down all the things that I was doing at both jobs. I wondered if someone else could do some of these things? In making out that list, it became very apparent that I was copying numbers over and over and over again into different forms at the winery.

For example, I would take a work order and put that information on an inventory form and other forms inneeded by myself and others at Kenwood, as well as government forms. Then, I said, wait a minute, if I have to copy all these numbers, all I really need to do is put that first number into the computer, and then the computer could deliver that number on the prescribed form by direction.

PW: What was the division of paperwork between you and Mike Lee?

BK: At that time Mike was doing the work orders and tank records, the record of wine movements from tank to tank. I was responsible for other 'practical' reports — inventory reports, records of varietal percentages and vintages, record of volume losses during racking, analyses, etc. The inventory data was necessary for the government reports, monthly and semi-annually. Our president, John Sheela, needed the inventory data to determine the dollar value in order to go, for example, to the bank to borrow money.

PW: How did you find Richard Hoover?

BK: After that plane trip, I had a great desire to get going on this idea of using a computer to help me. I called a computer expert in New York, a nephew of mine, but he was too far away, and didn't know winemaking. My computer friends at Standard Oil directed me to GE. The GE contact said they were too big, you need a person who is just starting out, and he suggested Richard, one of two young fellows in Sacramento who were just starting a service bureau.

I called Richard, and he said great! We got together and spent hours discussing winemaking, what records we keep and why. We worked together, with his computer knowledge and my experience with using the computer.

PW: How long did it take for Richard to find out what Kenwood wanted?

BK: That only took one afternoon at my house. I had already figured out what all the steps would be. I had a flowchart done and laid out the output forms. Richard took that information and started offering ideas.

PW: How did you justify Richard's cost to the president of Kenwood?

BK: I told John that I needed some help. Between the two jobs, it was too much, it wasn't fun anymore. John said, 'what do you need?' I need either lots of clerks or a computer, and I think a computer would be better in the long run because Kenwood is growing. Once we had smoothed out the winery operation, sales would pick up, and then I could justify the computer even better. John said, 'what will it cost?' Richard made a reasonable proposal and John said, 'go ahead, and keep me informed as to its usefulness and potential.

PW: Can you quantify the cost?

RH: The cost is less than the hiring of a clerk.

BK: And I would have to supervise the clerk — another task! I would like to have recorded the lab analysis on every one of our wines, but I could not cost-justify the computer memory for that at that time. It was easier for our wine chemist to keep those records.

PW: Richard, did you recommend a computer to Kenwood or timesharing on your own machine?

RH: When Kenwood approached us, we were doing other data service work on time-share at General Electric. The increased workload would not make GE cost-effective, so Datamasters bought a Texas Instruments series 990 model 8, two years ago. We have 512K of memory, three 50meg disk drives, four video terminals and a 600 line per minute printer. Bob's data is stored on a disk drive which is always available (on line).

PW: Richard, what did it take to respond to Bob, and have you found other winemakers similar or different?

RH: The computer end is pretty much the same, no matter which winery you talk to. Each winery has some unique problems, but they don't change the basic system. All wineries need the same thing — they have to keep track of what happened to the grape, from the time it entered the winery until the wine is sold.

All wineries fill out the same government reports — #702. We have geared the program to Kenwood, but it is programmed in such a way, that it can be easily modified to fit any winery's particular needs. We are continually making changes to the program, because the needs of the winery are going to change, due to growth or whatever.

PW: What does menu-driven mean?

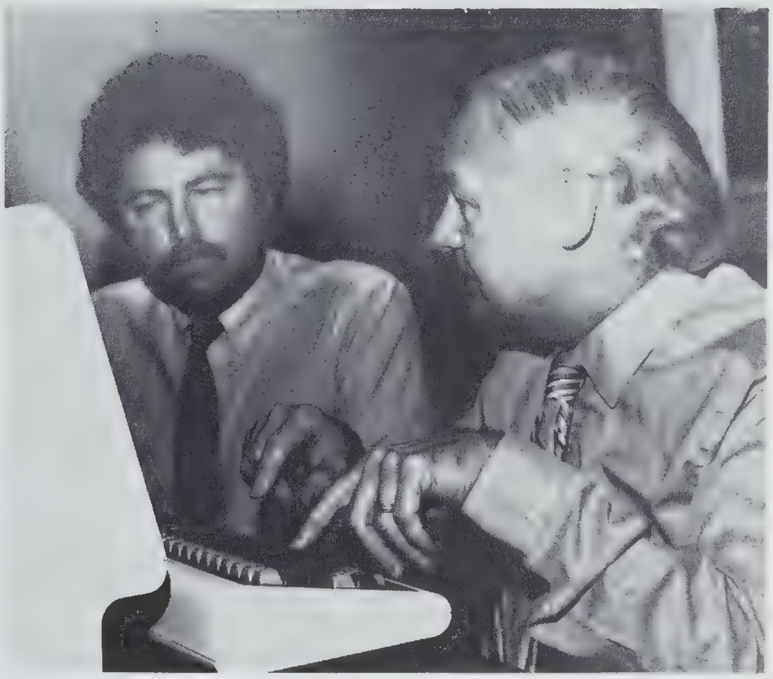
RH: We object to the term, but that is what it is. You can call up a menu on the video terminal. You read the menu and key it in on the keyboard, what you want to do, then another menu will appear. For example, you may want to run an inventory report. You read the menu of inventories available, barrel, bottle, case, tank — key in your choice, specific data necessary and the job is done.

PW: What computer language do you use?

RH: We use Fortran. Everybody else has used Cobol, but Fortran is a much faster operating language. It is designed to handle a lot of numbers in a scientific manner.

PW: Bob, what advantages will the computer offer you?

BK: Normally what happens is, you start by looking for one item as you think that is all you need. In practice, that item will lead you to another question and then another, which leads you to another set of records in memory. Having the data on-line, you can ask many questions from the same data. For example, you might want to know which tanks are empty or scheduled for bottling to plan wine movements between tanks. Or, you can make racking or topping plans more accurately. You can get that information quickly from a computer rather than compute it each time from a manual form.



KENWOOD WINEMAKERS — — Bob Kozlowski, winemaking consultant, explains a menu on the video terminal to Michael Lee, winemaker.

PW: How many different size tanks are there at Kenwood?

BK: We built our tanks to fit into the winery, so we now have about 80 tanks for more than 25 basically different sizes. This gives us a lot of versatility.

PW: How do you enter data into the computer?

BK: We use the winery work order which has the wine movement in gallons from tank to tank and the operation performed — i.e. fining, topping, racking, etc. which is coded into the computer. We also enter data from the bill of lading for the accounting side.

PW: Richard, what is your system's capacity for history of the wines?

RH: For Kenwood, on an annual basis, we will clear out work order history on wine that has been bottled and put that history on hard copy. We do have the capacity to offer historical retrieval on past winemaking activity at a reasonable cost.

PW: What computer equipment does Kenwood have?

RH: Kenwood has one video terminal with a keyboard and one-150 character/second printer, which are hooked up by telephone line to our computer in Sacramento.

PW: Richard, what are the economics?

RH: You can lease or purchase the video terminal and printer. There is a basic monthly telephone hookup fee of $140. The access fee is $10 per hour when you are turned on. The charge for use of programs and file storage is determined by the program requirements and the amount of file storage necessary. That charge will

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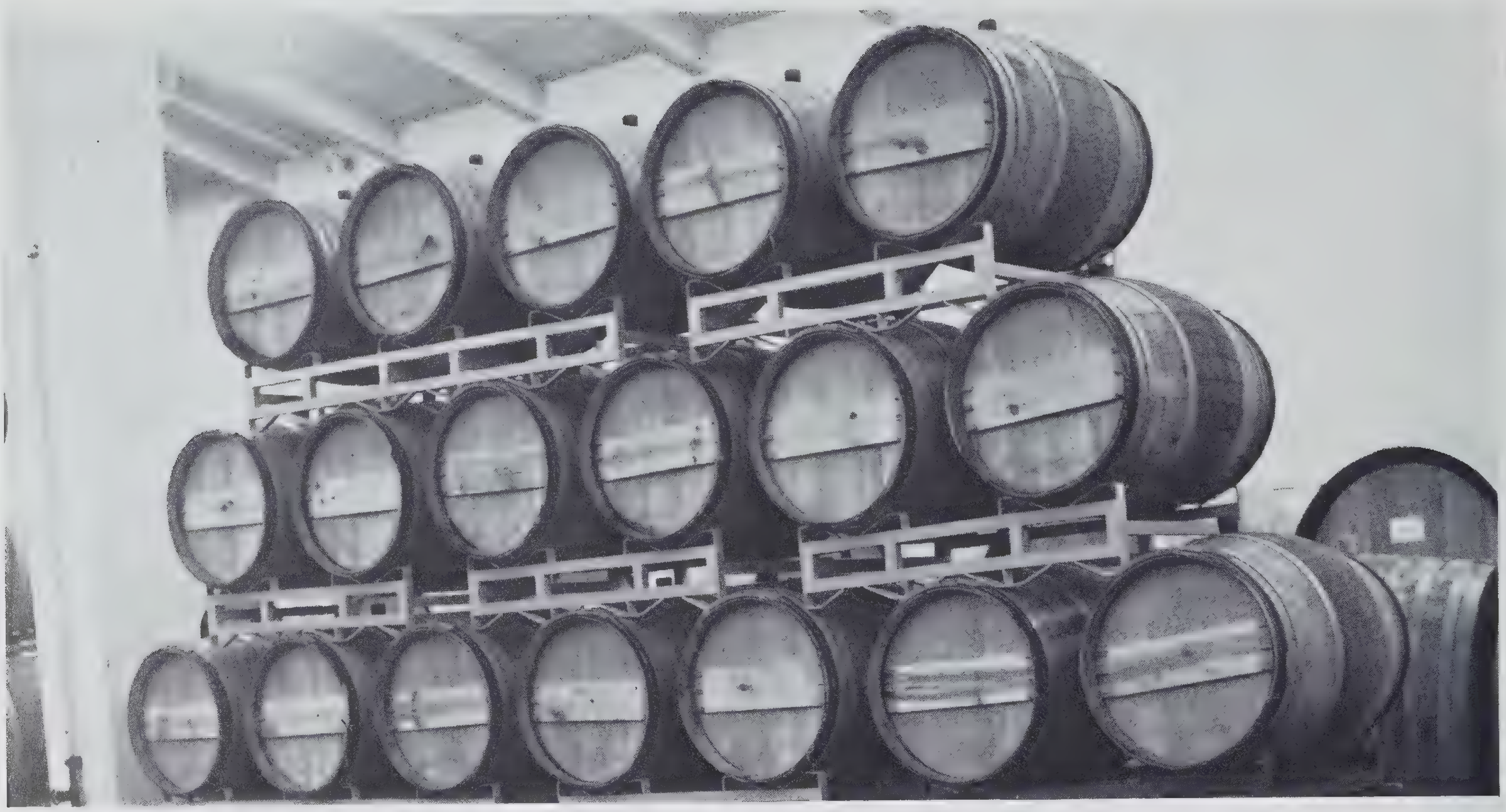


BARREL PYRAMID — — — Robert Mondavi Winery utilizes two and three barrel steel pallets to build a stable stack. The pyramid gives winemakers easy access to the bung holes for racking and topping, according to Glen Workman, supervisor of the Mondavi barrel room.

Steel Racks Have Many Patterns and Coatings

Practical Winery conducted this survey on makers of steel barrel racks to discover the variety of patterns and coatings available. Five companies were found in California. Prices are not included as they are affected by order quantity and commodity price of steel when the order is placed.

The basic design was born in 1975 at the Monterey Vineyard (which built a complete building around the use of the barrel pallet) and given to the industry at the WITS conference that year. Monterey Vineyard has improved their design to allow the forklift access from four sides instead of two.

Guadagni Bros. Welding in Healdsburg offers a universal pattern with either a three or seven inch opening for the fork lift. They apply red oxide coating onto square steel tubing, 1½″ by 1½″ by .065″. Delivery time is normally six weeks. Price discounts are available on quantity orders of 31-100 and over 100.

K & K Metal Construction in Napa uses tubular formed steel either dipped in a galvanizing coating or painted with epoxy. The pattern of the rack will depend on the winemaker's barrels and how high he wants to stack them. K & K can deliver in 30 days and quantity price breaks are available.

Ogletreés in St. Helena has five patterns of two barrel racks and can customize from them for a winemaker. Material used is 1½″ by 1½″ by .065″ carbon steel square tubing painted with a rust inhibitor primer with a color pigment of grey or brown.

Ron Ogletree recommends the four barrel pallet he has made for Beringer as a more stable pallet that can be stacked seven high. He suggests the two barrel rack only be used five high.

Delivery time is 14-21 days.

Unifab Enterprises in Gilroy has made a rack using the design of Luigi Fortino and Dr. Richard Peterson of Monterey Vineyards. The material is 1½″ by 1½″ by .075″ and painted utilizing an electrostatic coating process of baked enamel.

Rodney Haun of Unifab indicates the coating will not allow a foreign agent to get under the coating. Unifab has a pattern for French barrels and another for American barrels and can customize from them to a winemaker's order. Delivery time and price are affected by how large a production run is made.

Colors of coating available are maroon and white on American racks; white, silver or maroon on French racks.

Vintage Industries in Emeryville uses square tubing which is 1½" by 1½" by .065" and painted with a rust inhibitor. A universal pattern is available as well as a pattern for French or American barrels. The forklift space can be three or seven inches.

Vintage recommends stacking two barrel pallets five high and they make a rack for two puncheon barrels that can be stacked three high. Vintage has also made a three barrel rack which Robert Mondavi Winery uses to create a pyramid stack.

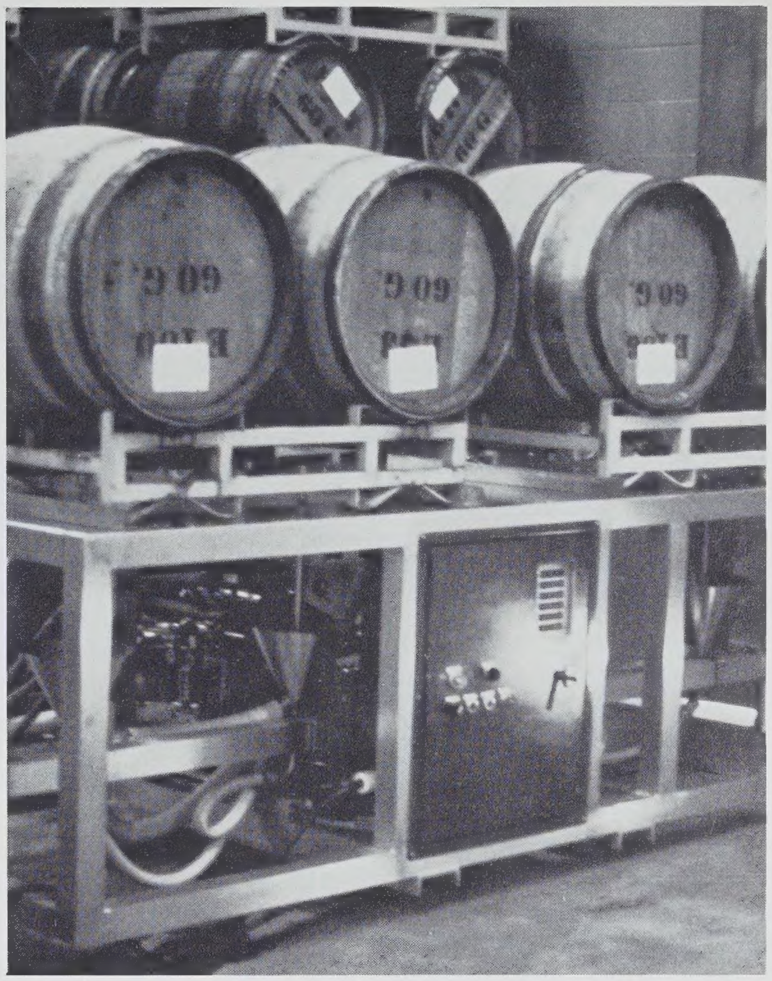
There are quantity price breaks at Vintage and delivery time will be quoted when an order is made.

Westec Winery Equipment of Healdsburg has built a barrel washing machine which utilizes steel barrel racks to transport and support the barrels during washing.

The two production machines have been built for Mondavi in Napa and Simi Winery in Healdsburg. The machine washes four barrels at once which are positioned on their steel barrel racks.

Tom Beard of Westec hopes to have a two barrel prototype built during 1982. The machine has an adjustable timing program for a five cycle wash.

The basic program includes three water washes, hot or cold supplied by the winery, as well as two other washing elements of the winery's choice. Simi and Mondavi use citric acid and soda ash. The winery must also supply air at 110 psi to the machine. A pneumatic device inserts a washing wand into each of four barrels at the same time.



BARREL WASHING MACHINE — — — Westec has made this machine which can wash four barrels together all at once. The barrels are resting on their individual barrel pallets.

PAST ISSUES

Practical Winery is based on useful articles and comment, it does not become useless as the calendar pages turn. We have the pleasure of offering the following back issues at a cost of $5 per copy.

VOLUME 1, NO. 1
Interview with Josh Jensen of Calera Wine Co.
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Sugar Determination via the Rebline method
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Education: Update on Fresno State

MLF

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careful use of SO_2, sterile filtration and analyses of the amount of malic acid in the wine. Originally, we felt that it would be best to have a malolactic fermentation proceed along with the sugar-alcohol yeast fermentation (and thus "get it over and be done with it,") but the sensitivity of malolactic organisms to SO_2 and oxygen, its rate of fermentation, and other conditions present during harvest seem to make such a combination difficult, if not impossible. However the U.C. Davis people are currently working to solve this problem.

For those that are interested, the chemistry involved is: $HOOC\text{-}CH_2\text{-}CHOH\text{-}COOH \rightarrow CH_3\text{-}CHOH\text{-}COOH + CO_2$.

As can be seen, malic acid has two carboxylic radicals and lactic acid only one, thus explaining the tartness of the former over the latter.

A more complete explanation of malolactic fermentation can be found in the *Chemistry of Wine Making*, edited by A.D. Webb, page 151, American Chemical Society #137; the chapter entitled "Malo-Lactic Fermentation and Winemaking" by R.E. Kunkee and in *Wine — An Introduction for Americans* by M.A. Amerine and V.L. Singleton.

Albert B. Cribari is a third generation member of the Cribari wine family. The winery, now located at Fresno, Ca., was founded in 1904 by Cribari's grandfather, Beniamino Cribari, in Santa Clara County.

Cribari grew up in the family's wine business, receiving on-the-job training in every facet of making and marketing wine. He formally joined Cribari & Sons as an enologist and chemist in 1941 while still attending college and, in 1943, graduated with a BS degree in chemistry from the University of Santa Clara.

He currently is vice president and the winemaster responsible for all the Cribari wines.

In February, Cribari released its first vintage-dated wine, a 1981 Napa Gamay Rose.

COMPUTER

Con't. from p. 19

range from $50 to $150 with an average of $100/month.

PW: Richard, when you have several winery clients, what about security of one's data from a competitor?

RH: We have one to four security code levels available. So the wrong person would have to know four unrelated code functions to get access to someone else's data — pretty impossible.

PW: Richard, are some wineries using something similar to your system presently?

RH: Several wineries presently use the Xerox Computer System for on-line accounting.

PW: Richard, for what size winery do you recommend your system?

RH: My basic parameter is 50,000 cases production per year, but it is available to anyone. What you see, may or may not be what you want, but we can do whatever you need with the basic system at no extra cost.

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